

SUMMARY
BIOLOGICAL OPINION ON THE EFFECTS TO THE RAZORBACK SUCKER,
MEXICAN SPOTTED OWL AND BALD EAGLE FROM THE PROPOSED
FOREST SERVICE REGION 3 MANAGEMENT ACTIVITIES

Date of the opinion: December 1, 1995

2-21-92-F-693

Action agency: U.S. Forest Service, Region 3

Project: Five grazing allotments on the Eastern Roosevelt Lake Watershed Analysis Area (ERLWAA).

Listed species affected: Razorback sucker (*Xyrauchen texanus*), Mexican spotted owl (*Strix occidentalis lucida*), bald eagle (*Haliaeetus leucocephalus*), and southwestern willow flycatcher (*Empidonax traillii extimus*). The Salt River in the project area has been designated an Experimental, Nonessential Population for the Colorado squawfish (*Ptychocheilus lucius*).

BIOLOGICAL OPINION: It is the Service's biological opinion that the implementation of the proposed action for the ERLWAA is not likely to jeopardize the continued existence of razorback sucker, Mexican spotted owl, southwestern willow flycatcher, or bald eagle, and is not likely to adversely modify or destroy critical habitat of the Mexican spotted owl.

Incidental take statement: The extent of incidental take of razorback suckers and southwestern willow flycatchers is not definable at this time.

Reasonable and prudent measures (RPMs): For razorback sucker, three RPMS were proposed as follows: 1) Take measures to ensure that the monitoring program for this action is sufficient to evaluate real improvement to wildlife habitats and vegetation communities; 2) Take measures to provide for additional revision of the grazing plans if significant progress toward meeting objectives has not occurred by the end of the 10-year grazing permit period; and 3) Take measures to ensure that those improvements affecting endangered or threatened species or in their habitats are constructed.

For southwestern willow flycatcher, two reasonable and prudent measures have been identified as follows: 1) Continue to monitor flycatcher as part of the statewide Partners in Flight survey and monitoring effort; and 2) Implement a cowbird management program at the flycatcher breeding area.

Terms and conditions: The mandatory terms and conditions required to implement the reasonable and prudent measures are described.

Conservation recommendations: Implementation of conservation recommendations is discretionary. Seven conservation recommendations are provided.

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In Reply Refer To:

AESO/SE
2-21-92-F-693

December 1, 1995

Mr. Charles W. Cartwright, Jr.
Regional Forester
USDA Forest Service
517 Gold Avenue SW
Albuquerque, New Mexico 87102-3292

Dear Mr. Cartwright:

The U.S. Fish and Wildlife Service has reviewed your request for formal section 7 consultation on the Eastern Roosevelt Lake Watershed Analysis Area (ERLWAA) located in Gila County, Arizona. Your April 7, 1994, request was received on April 11, 1994. This document represents the Service's biological opinion on the effects of that action on razorback sucker (*Xyrauchen texanus*), Mexican spotted owl (spotted owl) (*Strix occidentalis lucida*), bald eagle (*Haliaeetus leucocephalus*), and southwestern willow flycatcher (SWWF) (*Empidonax traillii extimus*). Designated critical habitat for the Mexican spotted owl (spotted owl) and razorback sucker in the Salt River and its 100-year floodplain is also within the project area. Colorado squawfish (*Ptychocheilus lucius*) in the Salt River within the proposed project area have been designated a non-essential experimental population. This biological opinion was completed in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.).

The biological opinion is based on information provided in the biological assessment and evaluation (BAE), a December 1994 environmental assessment, documents provided during the Integrated Resource Management (IRM) process, telephone conversations, meetings, field investigations, and other sources of information. The literature cited in this biological opinion does not represent a complete bibliography of all literature on the species listed above or the effects of grazing on those species. A complete administrative record of this consultation is on file in this office.

CONSULTATION HISTORY

The Forest invited the Service to participate in the IRM process for the proposed action in August of 1992. Since that time, the Service and the Forest have exchanged information on the project at meetings and via various letters and documents. The Service received the biological evaluation and environmental assessment (BAE), along with supporting documents, on April 11, 1994, with the request for formal consultation. The Service did not

concur with the Forest's determination in the BAE that the implementation of the proposed action would not affect the bald eagle. The Forest submitted a subsequent request for formal consultation for bald eagle on December 20, 1994.

A draft biological opinion was provided to the Forest on February 27, 1995, for razorback sucker, Colorado squawfish, spotted owl, and bald eagle concerns, along with a draft conference report addressing SWWF concerns. The SWWF was proposed for listing at the time the draft biological opinion was issued. A final rule listing the SWWF as an endangered species was published in the Federal Register (Service 1995a) on February 27, 1995, becoming effective on March 29, 1995.

The Service received a response to the draft biological opinion and conference report on April 25, 1995. Subsequent meetings have been held between the Forest and the Service to resolve remaining concerns with respect to this project. At the Forest's request, the Service has converted the conference report for SWWF to a biological opinion. The Service received an additional letter from the Forest to the Service on August 28, 1995, clarifying the Forest's determination of effects of the proposed action on critical habitat for the Mexican spotted owl as the critical habitat designation for the spotted owl became effective on July 6, 1995.

Initially, the Service determined that the proposed project would jeopardize the continued existence of the SWWF. Draft reasonable and prudent alternatives were developed and reviewed by the Forest Service. The draft opinion was provided to the Service's Regional Office in Albuquerque. On September 28, 1995, following review of the draft jeopardy opinion and reasonable alternatives, the Regional Office of the Forest Service decided to modify the proposed action to address adverse effects to the SWWF by incorporating the draft reasonable and prudent alternatives into the project description. Following receipt of the revised project description from the Forest on November 6, 1996, the Service revised the draft jeopardy opinion to a non-jeopardy opinion.

BIOLOGICAL OPINION

It is the Service's biological opinion that the implementation of the proposed action for the ERLWAA is not likely to jeopardize the continued existence of razorback sucker, bald eagle, SWWF, or spotted owl, and will not adversely modify critical habitat for the spotted owl.

DESCRIPTION OF THE PROPOSED ACTION

It is important to note that the project description is legally binding. Failure to conduct the action as described could constitute a project modification if it would adversely affect a listed species in a manner not considered in this opinion. As provided in 50 CFR §402.16, such a project modification would require reinitiation of formal consultation.

The ERLWAA consists of five livestock grazing allotments totalling 67,647 hectares (167,157 acres) at the eastern end of Roosevelt Lake, extending up the Salt River to the border of the White Mountain Apache Reservation. Only those portions of the Salt River are included in the grazing allotments are part of this analysis area. The remainder of the Salt River in this area is part of a the Hicks Pike Peak Allotment. The Poison Springs and Sierra Ancha Allotments are operated by one permittee, the A Cross and Dagger Allotments by a second permittee, and the Armer Mountain Allotment by a third permittee. The proposed action contains three new allotment management plans and continues current management on the Dagger Allotment.

The proposed action includes fence construction to create new pastures, new water development and distribution systems, road maintenance, and prescribed burns. Definitive data on the improvements and the burns was not included in the material provided and additional section 7 consultation may be needed for the implementation of these actions. Dates, season of use, and rotation schedules for pastures within the allotments were included in the information provided. The proposed action does call for periodic range inspections and production/utilization studies, and monitoring required by the Bureau of Reclamation as part of Plan 6 of the Central Arizona Project. In addition, an annual monitoring of riparian conditions is to be initiated three years after all improvements are in place. Although the grazing permits given under the proposed action would be for 10 years, the plan for the proposed action did not indicate the time required to complete all improvements. For more detail on the proposed action, please refer to the Forest documentation.

The proposed action was developed to meet the Forest Plan objectives, standards, and guidelines. The specific objectives of the ERLWAA have been defined as long-term (desired conditions) and short-term goals. The long-term goal is for the grazing strategy and improvements to be in place and implemented through the efforts of the Interdisciplinary Team. The short-term goal is to ensure the following:

1. Necessary improvements needed are in place and in working order.
2. The grazing strategy for livestock is initiated.
3. Riparian areas throughout the allotment are responding to the new grazing strategy. Ground cover in these areas increases by five to 10 percent. The number of seedlings and saplings of desired woody species also increases.
4. Herbaceous ground cover on the uplands increases by two to five percent, and desirable herbaceous plants begin to establish at lower elevations.

5. Ground cover in the uplands and riparian areas continues to improve, and habitat needs for those species dependent on riparian areas improves. Saplings of desired riparian plants become well established and strong evidence of regeneration for these species exists.

As part of the proposed action and in order to minimize adverse impacts to the SWWF, the Forest Service will:

1. Conduct an annual review of the grazing permits issued to determine if an adjustment to the number of cattle permitted to graze within the five allotments analyzed under ERLWAA is necessary based on the presence/ absence of annuals, current lake levels, and the amount of area inundated. The Forest will prepare an annual monitoring plan which will be approved by the Service prior to conducting monitoring for the first year. The Forest will conduct reviews and report results to the Service, on an annual basis for the first three years of the grazing permit.
2. Continue to monitor SWWFs as part of the statewide Partners in Flight survey and monitoring effort. Specifically, the Forest will obtain data on an annual basis including abundance, distribution, reproductive success, parasitism levels, causes of nest failure, territory size, habitat composition within territories, and nest-site habitat composition. In addition, the Forest will provide a list of other avian species, especially neotropical species, breeding in the area and any observations of parasitism or predation. The Forest will participate in the proposed statewide effort to be initiated by the Service for SWWF surveying and cowbird management. The Forest will conduct all surveying and monitoring efforts in accordance with procedures outlined in *A Survey Protocol for the Southwestern Willow Flycatcher (Empidonax traillii extimus)* (Tibbitts *et al.* 1994) by personnel trained in the use of the protocol and who have obtained the proper ESA permitting.
3. Implement a cowbird management program at the SWWF breeding area. The Forest will begin this program annually by April 1 and continue through July 31, or until the SWWF breeding season has ended (if earlier than July 31). The program will utilize a minimum of two traps to be checked daily. The Forest will provide a report annually in conjunction with SWWF monitoring results discussed in Item 2 and will include a map showing locations of traps, daily number and sex of cowbirds and non-target species captured per trap, and the dates of captures. Implementation of the management program will be conducted by the Forest until and unless the statewide cowbird management program is initiated by the Service and the Forest elects to participate in that program or until the species is de-listed. The Forest assumes responsibility for ensuring that the cowbird management program is conducted until such time as the statewide effort is initiated.
4. Implement all actions listed above for at least the first three years of the permit.

The Forest commits to meeting with the Service at the end of the three year period to reassess conditions within the ERLWAA and determine whether continuation of items one through four above is warranted.

DESCRIPTION OF THE PROPOSED ACTION AREA

Vegetation communities in the ERLWAA include Sonoran desertscrub/desert grassland (35 percent of the area), chaparral (18 percent of the area), piñon-juniper/mixed shrub (27 percent of the area) and ponderosa pine (20 percent of the area). There is limited distribution of riparian vegetation along the Salt River, tributary streams such as Coon and Cherry Creeks, and in desert washes. Within the project area, riparian condition is generally fair. While riparian areas and some upland areas have been overgrazed in the past, resulting in poor watershed conditions in some areas, other portions of the project area have received little use by livestock.

Above the influence of Roosevelt Dam and Roosevelt Diversion Dam, the Salt River has largely been unmodified by dams or diversions. In the headwaters of the Black and White Rivers, there are some diversions for agricultural, recreational, and municipal/industrial uses. These depletions reduce the amount of flow coming down the river, but the pattern of the natural hydrograph remains. Other human activities have had effects on the Salt River. Watershed degradation from roads, timber operations, and overgrazing by ungulates has an effect on the water quality by increasing sediment loads and changing runoff patterns that alter patterns of erosion and deposition. Over use by ungulates have adversely affected the productivity, availability, and water quality (including temperature and sedimentation parameters), and overall condition of riparian areas.

From June 29, 1994, through July 6, 1994, the Armer Fire burned approximately 5,760 acres in the A Cross and Armer Mountain Allotments threatening the Armer Mountain spotted owl management territory. Fire crews were, for the most part, able to hold the fire to the top of Armer Mountain and keep it completely out of the management territory. The indirect impacts of the suppression effort on the Armer Fire "may have affected" the spotted owl.

STATUS OF THE SPECIES (Rangewide)

Razorback Sucker

Biological information on the razorback sucker was recently summarized in *Battle Against Extinction*, edited by Dr. W.L. Minckley and Dr. James E. Deacon (Minckley *et al.* 1991) and in the Biological Support Document prepared for the designation of critical habitat for the species (Maddux *et al.* 1993). Information in this summary was taken from these two sources unless otherwise referenced. Please refer to these documents for more complete information on the biology of the razorback sucker.

The razorback sucker is an endemic fish species of the Colorado River Basin. Historically, large populations were found in the mainstem and major tributaries of the lower Colorado River. Gilbert and Scofield reported the species from the Salt River near Roosevelt in 1904, and a commercial fishery existed in Saguaro Lake. The species persisted in the lower Salt River reservoirs until the 1950s but was extirpated from Roosevelt Lake by the 1930s.

Adult razorback suckers utilize both quiet backwater areas and river channel habitats. Radio telemetry on adults released into the Verde River showed that the fish used pools and other slow water areas and avoided riffles (Clarkson *et al.* 1993). Telemetry studies from other locations have shown that some razorback suckers will make extensive up and downstream movements while others remain in the same immediate area. Both main channel and quiet water habitats were used.

Razorback suckers spawn in the spring on gravel bars, shorelines, creek mouths, and in backwaters. Cobble, gravel, or coarse sand substrates appear to be preferred. While larvae have been found in sheltered, quiet water areas such as coves or backwaters, little is known about larval and juvenile habitat preferences.

Beginning in 1981, razorback suckers were stocked into the Gila, Salt and Verde Rivers in an attempt to restore historic populations in these areas. Success of the program in the first years was very limited. Most of the small fry and juvenile fish stocked are presumed to have been lost to predation by non-native fishes such as channel catfish (*Ictalurus punctatus*), flathead catfish (*Pylodictis olivaris*) and various centrarchids. Since stocking of larger fish was initiated, survival rates have increased.

Colorado Squawfish

The most recent summary of the biology and distribution of the Colorado squawfish is found in the Biological Support Document prepared for the designation of critical habitat for this species (Maddux *et al.* 1993). Unless otherwise cited, information in this summary is from this reference.

The Colorado squawfish is the largest of the endemic Colorado River Basin fishes, reaching up to six feet in length. Historically, the Colorado squawfish was found in all the major rivers of the lower Colorado River Basin. It had been extirpated from the Gila and mainstem Colorado Rivers by 1960, although the last specimen taken in the lower basin was in 1975 from Havasu Creek in the Grand Canyon. The last specimen from Roosevelt Lake was taken in 1937.

Adult Colorado squawfish are found in a variety of water depths and velocities over silt, sand, gravel, and boulder substrates. Backwaters, runs, and eddies are used as are shallow shorelines. In the Verde River, sub-adult Colorado squawfish were found most often in pools (Clarkson *et al.* 1993).

Colorado squawfish often migrate long distances to reach spawning habitats, and the blockage of traditional migration routes by dams is likely a contributing factor in the decline of this species. Spawning areas are typically in the main river channel near areas of deep

pools and submerged bars. Substrates varied and were largely cobble and boulder, although a silt, sand, or gravel component was also present in many known sites. Larval and juvenile habitats may not be contiguous with spawning habitats. Fry are known to drift downstream to areas of shallow backwaters with little or no current. There is evidence that flooded bottomlands may provide nursery habitats.

Beginning in 1982, Colorado squawfish were stocked into the Salt and Verde Rivers under an Experimental, Nonessential Population rule. These stockings were not entirely successful due to several factors including predation by non-native fish species. Information from monitoring indicates that the Salt River introductions of Colorado squawfish were more successful than those in the Verde River (Hendrickson 1993).

Mexican Spotted Owl

The spotted owl typically inhabits forested mountains and canyons containing dense, uneven-aged forests with a closed canopy. These structural characteristics are most often found in mixed conifer or ponderosa pine/oak forests old enough to also exhibit a high incidence of trees with large cavities, broken tops, numerous snags, and heavy accumulations of downed logs and other woody material. When owls occupy younger forests, these usually contain remnant large trees or patches of large trees from earlier stands. In younger forests that support breeding owls, the nest and major roost sites are usually found where large trees, vertical diversity, and detritus remain from older stands. Spotted owl habitat on the Forest is fragmented by both naturally occurring topographic features and the effects of human activities on forested areas.

Background and status information on the spotted owl has been described in the Final Rule listing the spotted owl as a threatened species (Service 1993a), and previous biological opinions delivered to Region 3 of the U.S. Forest on August 23, 1993 and October 8, 1993. The information provided in those documents is included herein by reference.

Bald Eagle

The bald eagle was first listed as an endangered species on March 11, 1967. No critical habitat has been designated for this species. The bald eagle is a large raptor once found throughout North America near seacoasts, lakes, and rivers. Bald eagles nest in trees near these bodies of water. The primary food is fish, taken live or as carrion. Chemical contamination, chiefly by organochlorine pesticides, caused severe population declines and local extirpation throughout the species' range through reproductive failure and direct toxicity. Habitat loss, persecution, and disturbance also threaten the bald eagle.

Although not considered a separate subspecies, bald eagles in the southwestern United States are considered a distinct population for purposes of recovery efforts and Section 7 consultation under the Endangered Species Act (Service 1982, Service 1986). Southwestern bald eagles also differ behaviorally, frequently nesting on cliffs, a phenomenon rare outside this geographic region. The southwestern bald eagle nests early, with eggs laid in January or February. This is believed to be a behavioral adaptation to avoid the extreme desert heat of midsummer. The young eagles remain in the vicinity of the nest until June (Hunt *et al.*

1992). Approximately 36 bald eagle breeding areas (BAs) have been identified in the southwestern population in recent years. In 1995, 30 of the breeding areas were known to be occupied with each BA supporting one nesting pair. The majority of the population inhabits Arizona and is distributed along the Salt, Verde, Gila, and Bill Williams Rivers, and several major tributaries. Two BAs are known in New Mexico (pers. comm., S.O. Williams III, New Mexico Department of Game and Fish), and 34 in Arizona (pers. comm., G.L. Beatty, Arizona Game and Fish Department).

Although the geographic isolation of the southwestern bald eagle population was initially a matter of much debate, it is no longer believed that the bald eagles of central Arizona are reproductively isolated. In 1994, a male bald eagle that originated from eastern Texas was discovered breeding at Luna Lake in northeastern Arizona at 8,000 feet. The origin of the unmarked female was undeterminable. It is also suspected that some of the silver-banded birds observed in Arizona in recent years may have immigrated into this population. This new information and achievement of recovery goals of the 1982 Southwestern Bald Eagle Recovery Plan were the justification for including the southwestern population in the reclassification of the bald eagle from endangered to threatened. The reclassification became effective August 11, 1995.

There are three nesting territories within or adjacent to the project area. The Pinto Creek territory is in the Lake Pasture of the Poison Springs Allotment. The Redmond Territory is adjacent to the Lower Devore Pasture of the Dagger Allotment. The Pinal territory is not located on the project area; however, birds from this territory have been documented foraging at the inflow of the Salt River to Roosevelt Lake.

Southwestern Willow Flycatcher

The SWWF is a riparian obligate, nesting in riparian thickets associated with rivers, streams and other wetlands where dense growth of willow (*Salix* sp.), *Baccharis*, buttonbush (*Cephalanthus* sp.), boxelder (*Acer* sp.), tamarisk (*Tamarix* sp.), or other plants are present, often with a scattered overstory of cottonwood (*Populus* sp.). Nests are in thickets of trees and shrubs approximately four to seven or more meters (13-23 or more feet) tall, with dense vegetation from the ground or surface water to four or more meters (13 or more feet) high. SWWFs typically nest near surface water or saturated soil. At some nest sites, surface water may be present early in the breeding season with only damp soil present by late June or early July (Muiznieks *et al.* 1994, Sferra *et al.* 1995).

The Service included the SWWF on its Animal Notice of Review as a category 2 candidate species on January 6, 1989 (Service 1989). The SWWF was proposed for listing as endangered, with critical habitat, on July 23, 1993 (Service 1993b), and the final rule listing the SWWF as endangered was published on February 27, 1995. The listing became effective on March 29, 1995 (Service 1995a). The State of Arizona also lists the SWWF as endangered (AGFD 1988). Following the review of comments received during the public comment period, the Service deferred designation of critical habitat, invoking an extension

on this decision until July 23, 1995. Since that time, the United States Congress has placed a moratorium on listing activities under the ESA, requiring the Service to cease work on the designation of critical habitat until the moratorium is lifted.

ENVIRONMENTAL BASELINE

The environmental baseline serves to define the current status of the listed species and its habitat to provide a measure against which to assess the effects of the action now under consultation. While the baseline must focus on the conditions in the action area, to an extent the analysis must include information on the status of the species throughout its range. Any evaluation of the effects of the action under consultation must be made in the context of the overall status of each affected species.

The environmental baseline has two components. The first is a summary of the past and present impacts of all Federal, State, and private activities in the area of the proposed action, the anticipated impacts of all proposed Federal activities in the action area that have already undergone formal or early section 7 consultation, and the impact of any State or private activities which are contemporaneous with this consultation process.

The second component is a summary of the status of the affected species throughout its range. The effects of any completed or ongoing recovery actions is included, as are conservation actions, reasonable and prudent measures, and reasonable and prudent alternatives that have been initiated as a result of completed section 7 consultations.

The Salt River in the project area has been subject to the effects of Federal, State, and private activities. The most significant physical changes were the construction of Roosevelt Dam and later the other Salt River dams. There are some diversions of water upstream in the Black and White Rivers, but these have not yet altered the essential character of the river through the project area above Roosevelt Diversion Dam.

In addition to the physical changes to the river ecosystem, introductions of fish species not native to the Colorado River Basin were made for commercial and recreational purposes. There are only 36 species of fish native to the Colorado River Basin, 64 percent of which are not found outside the basin (Miller 1959; Carlson and Muth 1989). Over 70 species of fish have been introduced to the basin, and while not all introductions have been successful, many succeeded and non-native fish species dominate in nearly all the remaining aquatic habitats.

Most, if not all, of the significant physical and biological changes to the Salt River were accomplished prior to passage of the ESA. Consultation has been accomplished on Federal actions initiated since 1973, most notably on the Central Arizona Project effects to Roosevelt Dam and reservoir and on the Forest Plan. The Bureau of Reclamation received a biological opinion on the Central Arizona Water Control Project, Roosevelt Dam Element of Plan 6 on March 30, 1990, for the bald eagle. The Pinto Creek bald eagle nests in one

of the few large, remnant cottonwood trees found near the Salt River upstream from where the SWWFs were located. Upon dam completion the proposed action will increase the lake conservation pool level from 2136 feet to 2151 feet and will inundate 20 feet of the Pinto bald eagle nest tree. The Bureau of Reclamation predicts the new dam will be completed in December 1995 or January 1996.

Impacts of these human activities on the Salt River watershed have had profound effects on the Salt River and associated riparian areas. Water diversions and return flows, flood control projects, livestock grazing, timber harvest, and changes in annual flow due to off-stream uses of water have impaired the ability of the aquatic and riparian habitats to support native fish and wildlife. Development in the floodplain also eliminates portions of the natural riparian vegetation. Changes to the watershed that affect how runoff is delivered to the river affect patterns of erosion and aggradation of sediments and influence how the river moves across its floodplain. Erosion that results in tall, steep banks may prevent the flooding of the adjacent floodplain and cause changes in the depth to groundwater. Riparian vegetation may be altered or lost if the water table moves below the level their roots can reach.

Status of the Species in the Action Area

Razorback Sucker

Razorback sucker populations are declining throughout the remainder of its range. The only large population in Lake Mohave has dropped from an estimated 60,000 individuals to 20,000, and it is anticipated that this decline will continue as the old adults that make up the population continue to die. Successful natural recruitment has not been documented anywhere in the Colorado River Basin, although a few young fish have been found in some areas.

Reintroduction efforts, using hatchery reared larvae and fry, have been utilized in attempts to restore the razorback sucker to its historic range in the Lower Basin. Similar efforts have not been undertaken in the Upper Basin, although there is a Recovery Implementation Program in place that stresses the preservation of suitable flows to provide habitat for the species.

Beginning in 1981, the Arizona Game and Fish Department (AGFD) began to stock areas of the Gila, Salt and Verde Rivers with razorback sucker larvae and fry. Data taken indicated that predation on the stocked fish was extremely high and it was likely that survivorship was very low (Hendrickson 1993). There were recaptures of individual fish, but it was difficult to tell which stocking they were from. The stocking of fish over 250 millimeters (mm) in addition to the small fish began in 1987 and has shown greater promise. Fish stocked in 1993 were found in the Verde River in the spring of 1994, and an individual at large in the Salt River for six months was recently recovered from a flathead catfish stomach (Kirk Young, AGFD, personal communication). Stocking at larger sizes is still not a guarantee against predation. Reintroduction efforts along the lower Colorado River began with California's stockings of fry below Parker Dam in 1986 and 1987 (Langhorst 1988), but this effort was terminated in 1989.

Efforts to get recruitment to the population in Lake Mohave were initiated in 1986. The use of isolated coves or backwaters to rear larvae to 300 mm was explored. Initial efforts were not successful, largely due to physical constraints. However, in 1992, larvae were successfully reared in an isolated cove on Lake Mohave. Some of the juveniles produced were moved to another cove for additional growth and 320 were released into the reservoir (data from Tom Burke, USBR). In 1993, approximately 1600 fish were released and there has been some survival of these cove-reared fish. Five stocked in 1992 were recaptured during the spring surveys in 1993, and 10 stocked in 1993 were recaptured in 1994.

A similar cove rearing program is part of the Lake Havasu Fisheries Improvement project, a multi-agency effort to improve angler access and success rates. The project was initiated in 1993 with a goal of producing 30,000 razorback suckers for release into the reservoir over a 10-year period. No fish from this effort have been released to date.

The remaining natural razorback sucker populations are in danger of extinction in the wild, possibly by the early 2000s. The limited amount of recruitment suspected for this species is not enough to sustain existing populations. It is hoped that efforts to augment existing lower Colorado River populations will succeed in restoring populations that have the same genetic variance as the historic stocks in these areas. Re-establishment of large razorback sucker populations in the interior rivers of Arizona will likely require many years of effort and will require the development of agreements and rules prior to any releases. These may be difficult to develop and opportunities to expand the range of the species may be postponed or deferred as a result.

Colorado Squawfish

The Colorado squawfish has been extirpated from its historic habitats in the lower Colorado River basin. Populations persist in the upper basin in portions of the Green, Yampa, White, Gunnison, Colorado and San Juan Rivers. While successful recruitment to these populations has been documented, expansion of existing populations has not.

Attempts to reintroduce the Colorado squawfish to the Salt and Verde Rivers have had limited success. Fish stocked into the Salt River appear to fare better than those stocked into the Verde River (Hendrickson 1993). In the upper basin, the Recovery Implementation Program stresses the need to protect flows and migratory routes for this species.

Mexican Spotted Owl

The Forest Service has formally consulted on 162 timber sales and other projects in Arizona and New Mexico since August 1993. These projects have resulted in the anticipated incidental take of 36 spotted owls. In addition, the Bureau of Indian Affairs has consulted on one timber sale on the Navajo Reservation that resulted in an anticipated take of four spotted owls. The Federal Highway Administration in Arizona has consulted on one highway construction project that resulted in an undetermined amount of incidental take. This take will be determined following additional consultation.

The Service has identified 107 critical habitat units for the spotted owl totalling 4,734,874 acres in Arizona, Colorado, New Mexico, and Utah. Thirty-eight critical habitat units have been designated for Arizona totalling 1,991,611 acres. Portions of this analysis area fall within critical habitat unit AZ-TONF-5. Grazed acres within the critical habitat unit were not provided. To date, no formal consultations have been conducted for projects within this critical habitat unit.

Bald Eagle

The bald eagle has made substantial progress toward recovery. On July 6, 1995, the Service reclassified the southwestern bald eagle populations from endangered to threatened. The southwestern bald eagle population is exposed to increasing hazards from a regionally increasing human population. These include extensive loss and modification of riparian breeding and foraging habitat through clearing, changes in groundwater levels and hydrographs, and changes in water quality. Hazards also include increasing human disturbance from urban, rural and recreational encroachment into breeding habitat. This latter threat includes a host of activities documented by Stahlmaster (1987), such as shooting, poisoning, electrocution, and collision with vehicles, aircraft, transmission lines and structures.

The bald eagle population in the Southwest was probably never very large due to limited habitat and, in pre-industrial times, likely fluctuated in size in response to weather conditions (e.g. cyclic droughts and wet periods). Following the banning of domestic use of the pesticide DDT in 1972, the Arizona bald eagle population has increased despite increasing pressures of a regionally increasing human population and associated industrialization. However, while significant recovery has taken place, the bald eagle remains somewhat tenuously established in the Southwest. Various reports and records suggest that nesting bald eagles may have been more widely distributed in Arizona in the past. Approximately 20 historic site records strongly suggest the historic presence of bald eagle nest sites which are not known to have been occupied in the last decade (Hunt *et al.* 1992). These observations may suggest factors are at work that are currently limiting more rapid recovery or population expansion. These pressures compound the stresses of a naturally harsh environment for breeding bald eagles. Especially near population centers, eagle breeding sites face continually increasing threats from malicious and accidental harassment including shooting, off-road vehicles, low aircraft overflights, loss of nesting and foraging habitat from riparian degradation, and lethal entanglement in fishline, a threat documented by Hunt *et al.* (1992) and by AGFD (pers. comm., G.L. Beatty).

Much of the southwestern bald eagle population is exposed to the pressures described above. Approximately half of Arizona's 34 known breeding sites are located on rivers and near reservoirs that are easily and frequently accessed by the public, providing the potential for these threats. The Arizona Bald Eagle Nestwatch Program (ABENWP) continues to document disturbance at nest sites and frequently intervenes to reduce harassment. This intervention has proven not only effective, but perhaps crucial in maintaining the

southwestern population. Up to 50 percent of a given year's reproduction has been salvaged by ABENWP "rescue" operations. These include removing fishline and tackle from nestlings and returning nestlings into nests after they fell or jumped out in response to disturbance, or to escape extreme heat.

The bald eagle population in Arizona has increased in recent years. Protection of breeding and feeding areas is crucial to maintain that positive growth. Riparian and other wetland habitats must be maintained or enhanced for this species to continue to move toward recovery. The Salt River bald eagle breeding areas are important in maintaining and recovering the southwestern population. Three bald eagle breeding areas are potentially affected by the proposed action. Since 1990 both the Pinal and Pinto nests have shown a fluctuating degree of success. In 1990, 1991, and 1994, only the Pinal nest was successful. Redmond, the third breeding area of concern, was only successful in 1990 and has been unsuccessful in all subsequent years. In 1992 both nests failed, and in 1993 both nests fledged one young. In 1995, only the Pinto nest was successful and fledged two young. The Redmond breeding area was successful in both 1990 and 1995.

Southwestern Willow Flycatcher

The range of the SWWF includes southern California, extreme southern portions of Nevada and Utah, all of Arizona and New Mexico, west Texas, and extreme southwestern Colorado (Unitt 1987, Browning 1993). Although this range encompasses a large geographic area, the riparian areas that provide nesting habitat for the SWWF have always been relatively rare in this predominantly arid region. Historical (1902 collections of Herbert Brown, University of Arizona) and more recent information (Egbert 1981, Whitfield 1990) indicate that the SWWF can be a locally abundant, perhaps colonial species where suitable riparian habitat exists. However, loss and modification of nesting habitat is a primary threat to this species (Phillips *et al.* 1964, Unitt 1987, Service 1993b). Large-scale losses of southwestern wetlands and riparian areas have occurred, particularly the cottonwood-willow riparian habitats of the SWWF (Phillips *et al.* 1964, Carothers 1977, Rea 1983, Johnson and Haight 1984, Katibah 1984, Johnson *et al.* 1987, Unitt 1987, General Accounting Office 1988, Bowler 1989, Szaro 1989, Dahl 1990, State of Arizona 1990, Howe and Knopf 1991). Changes in riparian plant communities have resulted in the reduction, degradation, and elimination of nesting habitat for the SWWF, curtailing the ranges, distributions, and numbers of all three willow flycatcher subspecies in western North America, including SWWF (Gaines 1974, Serena 1982, Cannon and Knopf 1984, Klebenow and Oakleaf 1984, Taylor 1986, Unitt 1987, Schlorff 1990, Ehrlich *et al.* 1992). Loss and modification of southwestern riparian habitats have resulted from urban and agricultural development, water diversion and impoundment, channelization, livestock overgrazing, off-road vehicle and other recreational uses, and hydrological changes resulting from these and other land uses.

The former range of the SWWF in Arizona included portions of all major watersheds (Colorado, Salt, Verde, Gila, Santa Cruz, and San Pedro Rivers) (Willard 1912, Phillips 1948, Unitt 1987). However, SWWF habitat has declined throughout Arizona. Extensive loss and modification of riparian habitats have occurred throughout much of the state, and the habitat of the SWWF is now largely absent or altered (Phillips 1948, Phillips *et al.* 1964). Unitt (1987) concluded that "Probably the steepest decline in the population levels of *extimus* has occurred in Arizona . . . *extimus* has been extirpated from much of the area from which it was originally described, the riparian woodlands of southern Arizona."

An additional, critical threat to the SWWF is brood parasitism by the brown-headed cowbird (*Molothrus ater*). Brown-headed cowbirds (cowbirds) lay their eggs in the nests of other species, directly affecting their hosts by reducing nest success. Historically, cowbirds were associated with bison (*Bison*) on the Central Plains and were uncommon in the southwestern United States. Cowbirds became increasingly widespread in the late 1800s and 1900s as human settlements and livestock operations spread across the Southwest (Hanna 1928, Gaines 1974, Mayfield 1977a).

Where studied, high rates of cowbird parasitism of SWWF have coincided with population declines, or, at a minimum, resulted in reduced or complete elimination of nesting success by SWWF. In California, parasitism rates ranged from 50 percent to 80 percent between 1987 and 1992, when the population decreased 27 percent (Whitfield 1990, Harris 1991, Whitfield and Laymon, Kern River Research Center, unpubl. data). A parasitism rate of 100 percent was documented for SWWF in the Grand Canyon during 1993, when no young were fledged (Sogge *et al.* 1993).

Steady reductions in nest success over time eventually lead to population declines, and, ultimately, extirpation. High parasitism rates of up to 83 percent resulted in the precipitous decline of the endangered Kirtland's Warbler (*Dendroica kirtlandii*) (Mayfield 1977b). Mayfield (1977a) speculated that a species (or population) might be able to survive a 24 percent parasitism rate, but that losses much higher than that "would be alarming." Populations experiencing the high rates of parasitism and low reproductive success observed in some populations of the flycatcher are considered population "sinks," and are maintained only through immigration from other "source" populations (Pulliam 1988). Robinson *et al.* (1993), who documented a 76 percent parasitism rate for neotropical migrant species in three midwestern woodlands and a high population turnover rate, considered his sites to be population sinks, and speculated that annual population changes within woodlands reflected the availability of immigrants from outside the study area. The threat to SWWF by cowbird parasitism is underscored by high parasitism rates and low nest success documented in widely-separated breeding populations, and by a small, declining number of remaining birds. If populations throughout the range of the SWWF are experiencing similar rates of brood parasitism and nest success as those documented in California and the Grand Canyon of Arizona, then a source of immigrants may not be available to maintain existing populations in the future, and the species will experience further declines.

Current estimates for total numbers of remaining SWWF are 500 or fewer nesting pairs rangewide (Unitt 1987, Service 1993b). Within Arizona, from 42 to 56 territories were located in extensive surveys in 1993 (Muiznieks *et al.* 1994) and approximate 120 territories were located as a result of additional surveys in Arizona in 1994 (Sferra *et al.* 1995).

Occupied and potentially suitable SWWF nesting habitat exists within the proposed project area. The currently occupied habitat is an approximate 120 hectare (300 acre) dense stand of tamarisk with a few large, remnant cottonwood trees. Smaller stands and stringers of unoccupied but potentially suitable habitat are distributed discontinuously along the Salt River. Although tamarisk is not a native riparian plant species, recent surveys have shown that the SWWF use tamarisk for nesting. Tamarisk has spread rapidly along the southwestern watercourses, typically at the expense of the native riparian vegetation, especially cottonwood/willow communities. Some authors believe tamarisk may not provide SWWF nests the thermal protection that native broadleaf species do at lower elevations (Hunter *et al.* 1987, Hunter *et al.* 1988).

The spread and persistence of tamarisk has resulted in significant changes in riparian plant communities. The multi-layered community of herbaceous understory is often replaced by one monotonous layer. Plant species diversity has declined in many areas, and relative species abundance shifted in others. Other effects include changes in percent cover, total biomass, fire cycles, thermal regimes, and perhaps insect fauna (Kerpez and Smith 1987, Carothers and Brown 1991, Rosenberg *et al.* 1991, and Busch and Smith 1993). Long-term monitoring of nests found in tamarisk along the Colorado River in the Grand Canyon has revealed that these nests have consistently experienced extremely high rates (in excess of 60 percent) of brood parasitism by cowbirds.

One of the largest concentrations of SWWF found to date in Arizona was located within the project area during 1994 AGFD surveys. The large tamarisk thicket on the upper Salt River near the inflow to Roosevelt Lake was occupied by approximately 43 adult SWWF including 15 pairs, 10 territorial males and three individuals of unknown status. Additionally, two possible SWWF were sighted approximately one-half mile upstream adjacent to a small cottonwood grove in a small tamarisk thicket. Six nests with SWWF young were documented and one nest with two SWWF eggs and a young of undetermined species were located. One additional nest was too high to check contents, another potential nest was found when empty, and an additional empty nest was found with an agitated adult and a SWWF fledgling in the vicinity. Preliminary data from 1995 surveys indicate that the SWWF established 11 territories with eight pairs and nine nests at this site (Messing, Bureau of Reclamation, pers. comm.) With ten or fewer nests located in 1994 and nine nests located in 1995, and an even smaller number with known outcomes, the threat of brood parasitism by cowbirds to this population cannot be dismissed. Additionally, courtship and pairs of cowbirds were observed in the immediate vicinity of the known nest sight by breeding bird atlas volunteers. Altercations between willow SWWF and cowbirds were observed along the edge of the tamarisk patch. The outcome of the Tonto Creek nest was unknown in 1993, because less than optimal viewing conditions prevented positive identification of the nestling. However, two song sparrows and one yellow warbler were

observed feeding cowbird nestlings nearby (Sferra *et al.* 1995). Preliminary data from 1995 surveys indicate that one nest was parasitized at this site (Messing, Bureau of Reclamation, pers. comm.).

EFFECTS OF THE ACTION

Razorback Sucker

The effects of livestock grazing on the aquatic and riparian habitats result both from the actual use of these areas by livestock, and the conditions on the watersheds as a result of use away from the streams and rivers. The influence of watersheds on the aquatic and riparian habitats is the result of several factors. Amount of vegetative cover, substrate composition and erosion potential, slope, rainfall patterns, and other factors determine how water runs off the watershed to the stream. The speed with which water runs off the land, combined with vegetation cover and erosion potential of the substrate, has significant effects to the amount of sediments carried into the stream by these flows. If runoff is rapid, with large amounts of water quickly reaching a stream, erosion of streambanks may result.

Elimination or reduction of the amount and vigor of riparian vegetative communities also contributes to streambank stability. Banks with healthy riparian vegetation are more resistant to erosion than those banks lacking this type of vegetation.

The alteration of runoff patterns that changes sedimentation and erosion rates in streams and rivers results in changes to the available aquatic habitats. The proportion of pool/riffle/run habitats may be altered as the channel is eroded or deposition occurs. The presence of low sediment substrates may be reduced if fine sediments are transported. Changes to the water table, and the maintenance of year-round flows may also occur.

Grazing animals affect riparian vegetation in several ways. The first is by the tendency toward over-use of the plants themselves that prevents growth and reduces vigor. Recruitment of young plants may be reduced or eliminated as seedlings are either eaten or trampled. Second, in heavily used areas, compaction of the soil due to trampling may reduce the ability of seeds to grow there, creating areas of bare ground that are more easily eroded. Third, plant species composition may change as plants more vulnerable to overuse or that are unable to recruit in the area are replaced by others, and this new species composition may not provide the same level of bank protection or stabilization. The quality of wildlife habitats associated with the riparian vegetation may also be adversely affected. Since riparian vegetation contributes to the productivity of aquatic habitats, changes in amount or quality of vegetation may alter organic inputs. The presence of grazing animals concentrated in the riparian area may also increase the organic input to the stream or river.

As stated in the project documentation, livestock grazing on the five allotments in the ERLWAA has had adverse effects to the watershed and riparian and aquatic habitats. Overuse of some upland areas has occurred and one of the objectives of the new AMPs is to improve livestock distribution and use of available forage to promote better watershed conditions. The extent to which the existing situation has degraded the watershed was not specifically included in the documentation, but there is no question that degradation has

occurred. Because the magnitude is not known, it is not possible to determine the specific effects to the aquatic and riparian habitats. The effects must then be evaluated in a conceptual manner.

Two of the allotments, the Armer Mountain and A Cross, drain into Roosevelt Lake. Effects to aquatic and riparian habitats supporting endangered or threatened species from these allotments are limited. Much of the Sierra Ancha Allotment also drains to the river above the reservoir but below the Roosevelt Diversion Dam. In this zone of influence from the reservoir operations, it may be difficult to separate out the effects from the livestock use. The northern portion of the Sierra Ancha is in the Coon Creek drainage. Most of the drainage area in the Sierra Ancha, Poison Springs, and Dagger Allotments would be grazed by livestock.

The Poison Springs Allotment drains areas above and below the Roosevelt Diversion Dam. The Dagger Allotment drains to the Salt River above the diversion dam and includes the aquatic and riparian habitats along Cherry Creek. Livestock have access to the Salt River at the mouth of Cherry Creek. Access at Coon Creek is limited by steep topography and a narrow, rocky channel.

Portions of Coon Creek are in the Coon Creek Mesa and Oak Creek Pastures on the Sierra Ancha Allotment; Upper and Lower Coon Creek Pastures on the Dagger Allotment; and the Upper and Lower Dry Creek Pastures on the Poison Springs Allotment. The proposed action includes a fence along Coon Creek that would separate the Coon Creek Mesa and Oak Creek Pastures (although the pastures would be used as a unit, not separately), and enclosure fences in the Upper and Lower Dry Creek Pastures would exclude livestock from all reaches of Coon Creek in the Poison Springs Allotment.

The Coon Creek Mesa/Oak Creek Pastures would be used on a three-year rotation cycle. Grazing periods would be in four month blocks, with each block grazed once in the cycle. A 16-month rest period after the spring use of these pastures and four months rest between summer and winter use are planned. Depending upon placement of the fence and the actual operation of the pastures, livestock access to the riparian area along the creek would be reduced to some extent. If this reduction of access is tied to reductions in the number of livestock concentrating in the riparian as well as the length of use, it could serve to decrease the amount of physical damage to the banks from trampling and reduce the utilization of the riparian vegetation. Both of these pastures are quite large, and there are large areas of steep terrain. Keeping livestock from congregating in the riparian zone of Coon Creek and any other stream or wash may be difficult to achieve.

On the Dagger Allotment, the Upper and Lower Coon Creek Pastures are used as separate units in a five-year rotation cycle. Upper Coon Creek Pasture would be used five months (September to January) each year with seven months of rest (February to August). This pasture also has considerable areas of steep terrain that may result in livestock concentrating along the creek and in other accessible areas. While the livestock would not be in the riparian area during the growing season, there may be effects of grazing the same time of year over a number of years.

The Lower Coon Creek Pasture would be used for one month in January to February of each year, apparently as a route for livestock to be moved from the Upper Coon Creek to Upper Devore Pasture. Coon Creek, through this pasture, runs along the western edge near the boundary with the Poison Springs Allotment. Depending upon how the livestock are moved in this pasture, the effects to the creek could be limited. The brief time of use may be offset by efforts to keep the herd together, thus putting more pressure on local vegetation.

On the Poison Springs Allotment, livestock access to Coon Creek would be eliminated by the use of fences. The Upper and Lower Dry Creek Pastures would be operated as a single unit in a four-year rotation cycle. Because of the fence, it is assumed that effects from livestock trampling and grazing on riparian vegetation would not occur under the proposed action. Use of these pastures would cycle from winter to summer to spring, with four month rests between winter and summer and summer and spring. A 16-month rest would occur after the spring use. Effects to the watershed would continue, and these may effect the stream and stream channel, but the extent to which this would occur is not known.

Through the Lower Dry Creek Pasture, livestock can access the Salt River. Effects to banks and riparian vegetation would be expected when this occurs. Approximately one mile of the Salt River could continue to be affected.

The other major stream within the ERLWAA is Cherry Creek. This stream is entirely on the Dagger Allotment. The types of effects discussed for Coon Creek may also occur here. The Dagger Allotment would be run on a two herd plan. The Upper Devore Pasture is with one herd, and the Rock and Dagger Pastures are with the second. The largest portion of Cherry Creek runs through the Rock Pasture. The grazing scheme is six months use with one year rest, alternating between summer and winter use. The bottomlands of Cherry Creek provide corridors between the three separated blocks of this pasture and likely receive considerable use. The Upper Devore Pasture is below the Rock and is used from February to the first half of April each year. Use each early spring during the period of higher flows and start of the growing season may impede recovery of the riparian and aquatic habitats if livestock are not kept from concentrating in the creek bottom. The Dagger Pasture would be operated in sequence with the Rock Pasture alternating six months of summer or winter use with a year of rest.

The Dagger Pasture includes the confluence between Cherry Creek and the Salt River and borders a considerable length on the north side of the Salt River. The terrain is steep, but there are a few access points available, especially to the open spaces at the bends of the river. These areas, along with the mouths of tributaries, may be important habitats for the razorback sucker and Colorado squawfish because of the variety of conditions present in contrast to more confined portions of the river. These flat spaces are also vulnerable to overuse.

In addition to the use of the watershed for grazing, the efforts to improve the forage base through prescribed burns may have effects to runoff and sedimentation, at least over the short term. The Forest has committed to address each burn separately as the proposed action is implemented; therefore, this biological opinion will not consider the effects of burns in any detail.

Mexican Spotted Owl

No studies have been conducted to determine the direct and indirect effects of livestock grazing on the owl or its prey. As stated in the Draft Mexican Spotted Owl Recovery Plan (Plan) (Service 1995b), "grazing in or proximal to areas used by owls can influence the owl in three primary ways. First, alteration of plant communities or soil conditions can alter prey availability....Second, grazing effects that significantly reduce herbaceous ground cover and increase brush and small tree cover can decrease the potential for often beneficial low intensity ground fires while increasing the chance of high intensity, vertically spreading catastrophic fire (Zimmerman and Neuenschwander 1984). Third, the overutilization of riparian habitats can reduce or eliminate the establishment of important shrub (e.g., willows), tree (e.g., cottonwoods), and herbaceous (e.g., sedges) vegetative cover, and physically damage stream channels and banks (Ames 1977, Kennedy 1977, Kaufman *et al.* 1983, Blackburn 1984, Skovlin 1984, Clary and Webster 1989, Platts 1990). Overgrazing of riparian habitats, particularly in low to mid-elevation semi-arid lands has the capability to decrease the amount and suitability of potential dispersal and wintering habitat for this owl.

Grazing in desert scrub and grassland and riparian vegetation types is regarded as a threat potentially inhibiting movement of owls among mountain ranges. Grazing along with other factors has contributed to the dramatic reduction of structure and composition of historic riparian gallery forests. Grazing strategies that accelerate riparian restoration are strongly recommended in the Plan (Service 1995b).

Five spotted owl management territories (MTs) fall within ERLWAA. To our knowledge, the Forest has not delineated protected activity centers (PACs) as recommended in the Plan (Service 1995b) for these MTs. Of the five MTs, only the Armer Mountain MT will be subject to grazing. As currently drawn, 350 acres of suitable habitat in the MT will be grazed. The core area and the known roost are in the portion of the A Cross Allotment that will not be grazed.

Critical habitat for spotted owl became effective on July 6, 1995. Critical habitat unit AZ-TONF-5 is within the ERLWAA on the Armer Mountain Allotment. The Service believes that grazing in upland habitats is not likely to destroy or adversely modify critical habitat. Livestock grazing is not known to have any direct impact on the components of upland forest and canyon owl habitats (60 FR 29933).

Bald Eagle

The Southwestern bald eagle population is exposed to increasing hazards including extensive loss and modification of riparian breeding and foraging habitat through clearing, changes in groundwater levels, and changes in water quality. The effects of livestock grazing on the aquatic and riparian habitats result both from the actual use of these areas by livestock, and the conditions on the watersheds as a result of use away from the streams and rivers. The extent to which the existing situation has degraded the watershed was not specifically included in the documentation, but there is no question that degradation has occurred.

Southwestern Willow Flycatcher

Livestock grazing in riparian habitats typically results in reduction of plant species diversity and density, especially palatable broadleaf plants like willows and cottonwood saplings, and is one of the most common causes of riparian degradation (Carothers 1977, USDA Forest Service 1979, Rickard and Cushing 1982, Cannon and Knopf 1984, Klebenow and Oakleaf 1984, General Accounting Office 1988, Clary and Webster 1989, Schultz and Leininger 1990).

During a site visit on June 20, 1995, several cattle trails were noted within the occupied habitat area, and cattle could be heard within the immediate vicinity. Similarly, SWWF survey crews present in the area on July 2, 1995, noted approximately 15 to 20 cattle within the SWWF breeding area. Livestock grazing in the currently occupied nesting area and adjacent habitat will result in the establishment of additional trails or paths further contributing to habitat fragmentation and modification. As additional livestock trails are established, seedlings will be trampled, soil will be compacted and eventually the canopy closure will be diminished by preventing the establishment or reestablishment of vegetation. Nests found in the increasingly fragmented habitat will be more susceptible to brood parasitism by cowbirds. Livestock grazing within the project area, particularly concentrations of livestock at tanks, corrals, holding pastures, nutrient supplements, and areas with extensive shade will also facilitate cowbird parasitism. Cowbirds are not only attracted to livestock concentrations but will also utilize livestock in a dispersed setting. Although brood parasitism of SWWF nests was not confirmed at this site during AGFD 1994 surveys, cowbirds were observed in the SWWF nesting habitat and surroundings. Continual monitoring efforts and cowbird management will be needed at this site to control brood parasitism by cowbirds.

The Service anticipates that direct and indirect effects of the proposed activities will result in a decrease in productivity at this breeding location. The Service listed the SWWF as endangered because at current population levels, and with continuing threats, extinction is foreseeable. Thus, incidental take of individuals, loss of this local nesting site, an increase in nest parasitism, and loss or modification of adjacent habitat for population expansion further jeopardize the continued existence of the SWWF. Loss and modification of nesting habitat is one of the primary threats to this species (Phillips *et al.* 1964, Unitt 1987, Service

1993b). The extent of this loss is reflected by the extirpation of the species from large portions of its former range, and the predominantly small sizes of remaining populations. Human activities, such as livestock grazing and expansion of agriculture, have also facilitated the expansion of the cowbird's range westward. Bock *et al.* (1993) found that 40 percent of the riparian bird species they examined, including the willow flycatcher (various subspecies), were negatively affected by livestock grazing. Klebenow and Oakleaf (1984) listed the willow flycatcher (*adastus* subspecies) among bird species that declined from abundant to absent in riparian habitats degraded in part by overgrazing.

Parasitism rates up to 100 percent (proportion of nests parasitized) have been documented for SWWFs in parts of Arizona (Sogge *et al.* 1993), further contributing to the decline of this species. To ensure the survival and recovery of the SWWF, efforts to preserve and restore habitats and reduce the level of brood parasitism will be required.

Although the issue of habitat degradation is addressed in the new grazing strategy, the second equally important issue of brood parasitism by cowbirds was not addressed. Even with the expected habitat improvements, this population may continue to decline due to brood parasitism by cowbirds. The area currently contains one of the largest known concentrations of breeding SWWFs in the state. This population is important, for it may be a "source" population contributing to the survival of the species in other portions of its range. Any impacts on SWWF habitat, or on individual SWWFs along the Salt River, have the potential to negatively impact the survival and recovery of the SWWF.

The long- or short-term survival of an endangered species requires implementation of recovery actions as well as protection for individuals and the habitat. In cases of special urgency, actions that contribute to adverse conditions reduce the effectiveness of recovery actions that are or could be taken. Congress defined the purposes of the ESA in Section 2(b) which states:

"The purposes of this Act are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved..."

The definition of "conserve" is found in section 3(3):

"...to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary..."

Implementation of the proposed action is intended to improve existing watershed, riparian and aquatic conditions in the project area while continuing to provide for viable livestock operations. The time to full implementation, which is not addressed in the documentation but is assumed to be ten years as that is the length of the permits, is considerable when the project as a whole is considered. Since improvements to habitat condition do not

immediately appear, the time needed to restore the riparian and aquatic habitats becomes greater than 10 years. Whether this would have any effect on the restoration of the razorback sucker and Colorado squawfish populations in the Salt River is difficult to assess. With the declining status of these species throughout their range, efforts to improve habitat quality are needed. If the proposed action works as planned by the Forest, there would be improvements to endangered species habitats, but it is not known when those benefits would be realized.

Even with the expected habitat improvements, the SWWF population at the Salt River inflow may continue to decline due to brood parasitism by cowbirds. As previously stated, any impacts on SWWF habitat, or on individual SWWFs along the Salt River, have the potential to negatively impact the survival and recovery of the SWWF.

As part of the proposed action, the Forest has committed to conduct an annual review of grazing permits to determine if an adjustment to the number of cattle permitted to graze within the ERLWAA is appropriate based on the presence/absence of annuals, current lake levels, and amount of area inundated. The Forest will submit an annual report to the Service for the first three years of the permits. This will allow the Service to evaluate the impacts of grazing on vegetation within and surrounding the SWWF breeding area.

The Forest has also committed to participating in a proposed statewide effort for surveying and cowbird control to be initiated by the Service. The Forest will contribute personnel and/or funding to this effort once it has been initiated by the Service. In the interim, the Forest will ensure that the SWWF breeding area is surveyed each year during the breeding season, and that monitoring is complete following the survey protocol for the SWWF (Tibbitts *et al.* 1994). The Forest will also implement a cowbird management program at the SWWF breeding area and will maintain that program until and unless the Service initiates a cowbird program and they elect to participate in that program.

The Service anticipates that direct and indirect effects of the proposed activities for the ERLWAA will be offset by the surveying, monitoring, and cowbird trapping efforts described above. Because incidental take of individuals, loss or degradation of the Salt River nesting site, an increase in nest parasitism, and loss or modification of adjacent habitat for population expansion would jeopardize the continued existence of the SWWF, the Forest has included within the proposed project description a commitment to meet with the Service three years after permit issuance to determine that surveying, monitoring, and cowbird trapping are effectively preventing a jeopardy situation.

CUMULATIVE EFFECTS

Cumulative effects are those effects of future State or private activities that have no Federal connection, and that are reasonably certain to occur within the action area of the Federal action subject to consultation. Projects without a Federal nexus may require section 10(a) permits (Habitat Conservation Plans) to comply with section 9 of the ESA. The Service

understands that the non-Federal entities along the river are presently evaluating the potential benefits and costs of obtaining a section 10 permit to cover their operations.

There are only limited areas of private land within the project area on which actions could take place that would affect listed species. Some activities that could affect the Salt River or tributary streams would be covered under provisions of the Clean Water Act or other Federal statute. There are parcels of private land used by livestock within travel distances of cowbirds. The increase in the cowbird population attributable to livestock grazing on private lands is not determinable at this point in time.

INCIDENTAL TAKE STATEMENT

Sections 4(d) and 9 of the ESA, as amended, prohibit taking (harass, harm, pursue, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Forest has a continuing duty to regulate the activity covered by this incidental take statement. If the Forest (1) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

The activities covered under the ERLWAA have not previously undergone section 7 consultation, except as covered in the consultation on the Tonto National Forest Plan. The Plan provided conceptual management direction and the overall effect of this management was evaluated under section 7; however, specific actions were not included in that consultation. Because of the nature of the Plan, no incidental take statement was given. As specific actions under the Plan direction were reviewed and implemented, additional section 7 consultation would be needed. As a management document, it provides direction, but it also identifies on the ground projects that would be put in place during

implementation. It should be noted that individual BAEs will be prepared for each prescribed burn.

Razorback Sucker

The extent of incidental take of razorback suckers from the implementation of the ERLWAA is not definable at this time. There has been degradation of aquatic and riparian habitats as a result of past grazing management on the allotments, but this has not been quantified. Changes to the grazing systems that improve range conditions and reduce or eliminate livestock access to riparian areas would, if implemented, contribute to a reduction in the amount of incidental take that presently occurs. If there is an improvement in habitat quality as a result of the preferred action, this could reduce this existing level of take that resulted from past management. This reduction does not eliminate take resulting from the proposed action, nor does it eliminate the past level of take that has resulted from livestock management decisions. Because of the types of habitat degradation that have occurred, recovery of these habitats may be slow and difficult to evaluate.

The key to the success of the project is timely implementation of the entire action and monitoring of conditions before and after implementation. The environmental assessment contains a general discussion of monitoring, but no specifics. If the project is successful, the reductions in take would be realized. If the project is unsuccessful, take would not be reduced. If improvements are not realized, then there must also be an opportunity to re-evaluate the project and make adjustments.

In a biological opinion, the Service is required to provide the action agency with a level of incidental take and a means to identify when that level has been exceeded. In this case, the actual level of incidental take of razorback suckers that would result from the ERLWAA is not definable. The Forest has identified protection and improvement of riparian resources and watershed condition as objectives. If these objectives are not met, then the level of incidental take would not be reduced. Because monitoring programs are subject to postponement or suspension due to funding or manpower constraints, using an ongoing monitoring plan as the sole index for determining incidental take is inappropriate. The Service believes that timely project completion, or the lack of completion, can be used as an index to identify when incidental take has been exceeded. Under this concept, if any of the following conditions occur, incidental take from the proposed action will be considered to have been exceeded:

1. If the new grazing rotations are not fully implemented within one full grazing cycle for the particular allotment or five years (one half of the 10-year grazing permit period).
2. If the ongoing and other required monitoring programs are decreased or discontinued.

REASONABLE AND PRUDENT MEASURES FOR RAZORBACK SUCKER

The following reasonable and prudent measures are required to reduce the level of incidental take resulting from the implementation of the proposed action.

1. Measures will be taken to ensure that the monitoring program for this action is sufficient to evaluate real improvement to wildlife habitats and vegetation communities.
2. Measures will be taken to provide for additional revision of the grazing plans if significant progress toward meeting objectives has not occurred by the end of the 10-year grazing permit period.
3. Measures will be taken to ensure that those improvements affecting endangered or threatened species or in their habitats are constructed.

Southwestern Willow Flycatcher

Take may result from the loss of a local nesting site, loss or disturbance of a nest, loss or modification of adjacent habitat for population expansion, and nest parasitism by cowbirds. The Service has developed this incidental take statement on the premise that all actions of the RPA will be implemented. The Service anticipates incidental take of SWWFs will be difficult to determine for the following reasons:

1. The number and location of cowbirds and SWWFs will vary from season to season.
2. The small, fluctuating number of breeding SWWFs in a given location precludes the application of numerical standards for take. In addition, nest placement and nest heights may hinder attempts to document the outcome of all nesting attempts at a given location.
3. The initial success of the cowbird management program cannot be predicted.

While the Service cannot predict the exact level of take that could occur, it is anticipated that cowbird parasitism in this area could result in the take of the entire breeding population at the Tonto Creek inflow, as has been demonstrated in other areas of saltcedar habitat. However, the Service has determined that the level of take can be minimized and would therefore not be likely to result in jeopardy to the species when the reasonable and prudent alternative actions listed above are implemented.

REASONABLE AND PRUDENT MEASURES FOR SOUTHWESTERN WILLOW FLYCATCHER

Two reasonable and prudent measures have been identified for the proposed implementation of the ERLWAA grazing strategy.

1. The Forest will continue to monitor SWWF as part of the statewide Partners in Flight survey and monitoring effort.
2. The Forest will implement a cowbird management program at the SWWF breeding area.

TERMS AND CONDITIONS

To be exempt from prohibitions of section 9 of the ESA, the Forest must ensure compliance with the following terms and conditions which implement the reasonable and prudent measures described above.

1. The following terms and conditions are required to implement reasonable and prudent measure 1:
 - 1.1 Obtain annually data including abundance, distribution, reproductive success, parasitism levels, causes of nest failure, territory size, habitat composition within territories, and nest-site habitat composition.
 - 1.2 Provide a list of other avian species breeding in the area and any observations of parasitism or predation.
 - 1.3 Conduct all surveying and monitoring efforts in accordance with procedures outlined in *A Survey Protocol for the Southwestern Willow Flycatcher (Empidonax traillii extimus)* (Tibbitts *et al.* 1994) by personnel trained in the use of the protocol and who have obtained the proper ESA permitting.
2. The following terms and conditions are required to implement reasonable and prudent measure 2:
 - 2.1 Initiate cowbird trapping program by April 1 and continue through July 31, or until the SWWF breeding season has ended (if earlier than July 31).
 - 2.2 Use a minimum of two traps.
 - 2.3 Provide a written report annually, in conjunction with SWWF monitoring results discussed in the terms and conditions for reasonable and prudent measure 1, that includes a map showing the locations of traps, daily numbers and sexes of cowbirds and non-target species captured per trap, and the dates of captures.

- 2.4 Check traps daily, disposing of cowbirds in a humane manner and releasing any non-target species.
- 2.5 Continue to conduct the trapping program until and unless a statewide cowbird management program is initiated and the Forest elects to participate in that program.

The Forest shall report to the Service any mortality of a razorback sucker or SWWF during the course of the activity. If there is a mortality, the Service should be contacted within 72 hours.

While the incidental take statement provided in this consultation satisfies the requirements of the ESA, as amended, it does not constitute an exemption from the prohibitions of take of listed migratory birds under the more restrictive provisions of the Migratory Bird Treaty Act.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

We recommend the following actions:

1. Eliminate all livestock access to the Salt River.
2. Forego the use of pastures with riparian or aquatic resources to reduce effects and foster recovery of these areas.
3. Delineate PACs, as recommended in the Draft Plan (Service 1995b) for the MTs within the analysis area.
4. Minimize livestock grazing within PACs or spotted owl MTs and unsurveyed suitable owl habitat until studies addressing these issues have been conducted. The Recovery Team recommends that studies/research be conducted on the effects of land management activities (including grazing) on owl habitat use and owl fitness.
5. Initiate a study to help determine the effects of livestock grazing on the prey base of bald eagles.
6. Implement a study to determine if brood parasitism rates or trends can be determined from surrogate species, which might help minimize researcher disturbance of nest sites and nests of the SWWF.
7. Continue cowbird trapping, if considered necessary, after the species is de-listed and/or after cattle have been removed if other, non-project related cowbirds continue to parasitize SWWF nests in this area.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION - CLOSING STATEMENT

This concludes formal section 7 consultation on the Eastern Roosevelt Lake Watershed Analysis Area as described in your request for formal consultation. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Failure to conduct the action as described would constitute project modification in a manner that could cause an adverse effect to the above referenced species not considered in the opinion and, as provided in 50 CFR §402.16, would require reinitiation of formal consultation. The Service requests notification from the Forest should the proposed action be implemented in a manner inconsistent with the proposed action as described within this opinion.

In future communications on this project, please refer to consultation number 2-21-92-F-693. The Service appreciates your continued efforts conserve and recover endangered species. If there are any questions about this biological opinion, please contact Mary Richardson, Lesley Fitzpatrick, or Bruce Palmer.

Sincerely,



Sam F. Spiller
Field Supervisor

Mr. Charles W. Cartwright

29

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